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FLAP WITHOUT PEDICLE.

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A CASE OF ECTROPION TREATED BY TRANSPLANTATION OF A LARGE FLAP WITHOUT PEDICLE.

BY O. F. WADSWORTH, M. D.

THE following case is one of deformity in consequence of a burn, successfully operated on by a method recently proposed and carried out by Mr. Wolfe, of Glasgow; a method which consists in the transplantation of a large piece of skin, without pedicle, upon the surface of a fresh wound. Mr. Wolfe published, in the *London Medical Times and Gazette*, June 3, 1876, a brief account of two cases of ectropion thus operated on. This method offers so important an improvement in our means of dealing with deformities resulting from cicatricial contraction following injuries that now, in its infancy, any instance of its successful application appears worthy of notice. It must prove particularly valuable in cases of destruction of part or the whole of the skin of the eyelids. At the worst, even if the transplanted skin should not live, the condition of the parts still remains as good as before the operation, while, on the other hand, if a flap taken from the neighboring skin sloughs, the effort of the surgeon has resulted only in rendering the deformity greater than ever. The face, on account of the great vascularity of its tissues, offers, of course, a specially favorable ground for the performance of the operation; whether it can be effectively employed in other parts of the body remains to be seen.

A healthy, well-grown girl of sixteen years, who had been burned on the left side of the face while an infant, was brought to me by her father in the latter part of July, 1876. A cicatrix, not generally very dense, involved all the skin in the vicinity of the left orbit. The left eyebrow, its hair follicles in part destroyed, was dragged downward so as to stand at a considerably lower level than the right; the upper lid was much shortened, and the lower so much pulled down that its conjunctiva was completely everted. On attempted closure of this eye a space remained open between the lids throughout their whole length, narrow at the outer part, but some 2''' in width between the puncta lachrymalia. There was moderate thickening of the conjunctiva of the lower lid thus continuously exposed. The cornea had continued normal.

July 30th, the patient having been etherized, an incision was made

through the skin of the lower lid, parallel to, and $1\frac{1}{2}''$ below the lashes. The inner extremity of the incision was just below the punctum, and it extended outward half an inch beyond the outer canthus. The tissues were dissected till the edges of the lid could be easily raised far enough to reach the upper lid and allow replacement of the everted conjunctiva. Then the two lids were fastened together by four sutures



passed through their free edges. This left a raw surface $1\frac{5}{8}''$ in a horizontal, and $\frac{5}{8}''$ in a vertical direction at their widest part. Next, a portion of skin was removed from the inner side of the fore-arm, about $2\frac{1}{2}''$ by $1\frac{1}{4}''$ in size. This was dissected off as cleanly as possible, to avoid the presence of subcutaneous connective tissue, and after separation was laid with its inner surface upward across the fingers of the left hand, while a few shreds of connective tissue still adherent were removed with curved scissors. Its inner surface, thus prepared, was quite as pale as the outer, very nearly smooth, dotted with minute depressions filled with fat cells, and recalled in some degree the appearance of the outer surface of a side of sole leather. It was scarcely $\frac{1}{2}''$ in thickness. The shrinkage on removal was very considerable, and the detached skin when spread out on the clean, raw surface of the lid was barely more than sufficient to cover it easily. At this part of the operation a little difficulty was experienced, since the thin layer of skin tended to roll in on its under surface, and to obviate this tendency, at one point just below the outer canthus, where the surface of the wound made a double curve, two fine sutures, $\frac{3}{16}''$ apart, were placed. Gold-beater's skin was laid over the lids and covered by thick layers of cotton-wool secured by a flannel bandage. The sound eye was also bandaged to secure immobility. The edges of the wound in the fore-arm were dissected up and brought together.

The dressing was not disturbed for forty-eight hours. At the end of that time the bandage and cotton-wool were removed. Through the transparent gold-beater's skin it was seen that the outer two thirds of the transplanted piece lay quite smooth, its color normal, and its edges in exact juxtaposition to those of the surrounding skin, while only a thin, dark line marked the boundary between them. There appeared to be absolutely no swelling. The inner third of the graft was somewhat uneven, and the inner two of the sutures intended to hold the lids together had broken away and allowed the lower lid to fall down a little. Some mucus and tears had run out from the conjunctival sack and smeared the innermost portion of the graft and the skin about it. To remove the mucus a part of the gold-beater's skin was cut away and the skin washed with a weak solution of carbolic acid. A little cotton moistened with carbolic-acid solution was laid over the inner canthus, and the packing and bandage were renewed.

The next day the graft was everywhere in good condition. Even at the inner corner, where its edge was a little raised and at first appeared unattached, a minute fragment snipped off with scissors seemed alive. Cleansing and packing were repeated daily. The gold-beater's skin was removed on the fifth day after the operation, the bandage was omitted, and the sutures holding the lids together were removed on the eighth day. The graft was now everywhere firmly united, although furrowed horizontally along its entire length by a shallow fold.

On the tenth day I found the edges of the graft at some spots a little thickened and paler, and feared suppuration might be taking place beneath, but this proved to be only the commencement of a throwing-off of the horny layer of the epidermis, the same process as is well known to occur in the ordinary minute skin grafts. It was five or six days later before the horny layer was thrown off over the whole surface.

The girl was sent home eighteen days after the operation. Union was everywhere perfect, the ectropion completely relieved, and the dragging



down of the brow considerably lessened, but still the lids could not be brought quite together over the inner half of their length. The graft then measured $1\frac{3}{8}''$ by $\frac{3}{8}''$.

Four months from the time of operation the patient was seen again. The ectropion was still entirely relieved, and she had been able to attend school regularly without inconvenience, though the lids hardly closed as much as at the time she went home. The engrafted skin had become a little narrowed at its inner end perhaps, but it yet measured $1\frac{3}{8}''$ in length and $\frac{3}{8}''$ in width at the widest part. It showed but little difference of level from that of the surrounding skin. The day was cold, and the new skin appeared considerably paler than the skin about it; this paleness, as was to be expected, was stated to be more marked on exposure to cold, but to be gradually becoming less noticeable.¹

The shrinkage of the thin layer of skin removed to form the graft

¹ The cuts were made from photographs taken the one immediately before, the other four months after the operation. The size of the photographs was not exactly the same, but it was thought best to reproduce them as they were.

was decidedly greater than that which occurs in the flap of much greater thickness and retaining its connection by a pedicle, which is ordinarily employed in plastic operations, and this fact should not be lost sight of in estimating the size of the flap to be taken. How large a surface may be successfully covered by this method at once can be determined only by experiment. The surface covered in the case reported was larger than that in either of Wolfe's cases; in each of those it was about the same size and somewhat less in length than the free border of the lids. If the attempt were made to cover a much larger surface at one operation it would probably be better to apply more than one graft, both on account of the greater convenience this would give of obtaining sufficient skin for the purpose, and because the difficulty of getting the thin graft to lie flat must increase with its size.

Wolfe took the precaution to set the flap so that the edges of the surrounding skin overlapped it and answered the purpose of stitches. The experience of the above case shows that such a procedure is evidently unnecessary, and certainly if employed here, union at the edges could not have taken place so readily and evenly. Of course the surface laid bare should be made as smooth and clean as possible, and hæmorrhage from it should be checked before the graft is placed in position.

But is it absolutely necessary that the transplanted material should be so thin and so carefully freed from all subcutaneous tissue? Wolfe was led to think so from observing the behavior of flaps in which connection was retained by a pedicle, where the operation was only partially successful. The occurrence of serous discharge and suppuration in such cases he regarded as the result of an effort to throw off the connective tissue previous to adhering. This consideration is not, however, convincing. A stronger argument is found in the fact that in his first case, in which the flap was divided into three pieces, one piece, supposed to have been sufficiently freed from connective tissue during removal, was placed in position without further preparation and in great part sloughed, while the other two pieces, from which the connective tissue was carefully cleared after their removal, lived. Moreover, experience has shown the successful application of minute skin grafts to be dependent on their freedom from subcutaneous tissue. More evidence is desirable definitely to settle the question.

